

ing districts of the Southwest, and more especially in Texas, the special warnings of freezing weather prompted measures of protection which resulted in averting large losses of produce.

The value of the warnings of freezing weather to the truck farmers is indicated by the following letter addressed to Dr. I. M. Cline, section director, Weather Bureau, Galveston, Tex., by Mr. B. F. Johnson, President Gulf Coast Horticultural Association:

I want to thank you, and through you, the Weather Bureau people for the promptness and accuracy of your warnings. We could not get along without them.

Four years ago you began giving us these warnings and since that time our truck farming has increased ten fold and will continue to grow under the fostering care of the Weather Bureau.

Your forecasts have been, in the main, correct to a degree, and I trust you will be permitted to continue the good work.

CHICAGO FORECAST DISTRICT.

Warnings were issued on the 4th for the cold wave which covered the eastern portion of the district on the 5th. No other cold wave of importance appeared until the 26th, the weather, as a rule, continuing comparatively mild in the meantime. In rapid succession three areas of high barometer with extreme cold moved across the district from the northwest, the first appearing the morning of the 26th, the second the morning of the 28th, and the third during the day of the 29th. Signals were ordered and warnings sent well in advance of the cold waves, except in the extreme Northwest, before the sudden development of the 28th.

The temperature forecasts have been closely watched by various interests, the movement of perishable goods being absolutely controlled by the forecasts during the winter months. The shipping interests which maintain winter service on Lake Michigan have been furnished information regarding winds whenever such information might be of value, and on the evening of the 25th a warning was issued that it would be dangerous to leave port, especially to vessels bound to or from points on the east shore of the lake.—*H. J. Cor, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

Prior to January 1 there had been a period of extreme drought which had prevailed in this State for twenty-one months. On December 31 a general rain warning was distributed throughout northern California, and on the morning of the 1st a similar warning was distributed in southern California. Rain forecasts were generally made for the next two weeks, when there was much rainfall in the State, an average of 3.50 inches, or more than one-half of an inch above the January normal, which has rendered it decidedly probable that good crops will be obtained from the northern half of the State and has prevented serious injury to stock and grain prospects in the southern part of the State.

On January 6 a southeast storm signal was hoisted at Eureka, and on the 9th at San Francisco and points north, while the information signal was displayed at Port Harford. These signals were continued on the 10th and storm signals ordered as far south as Ventura, and at 8 a. m. information signals were ordered at Los Angeles and San Diego. The information signals were changed to storm at 2:30 p. m. of the same date. Storm signals were continued from Ventura northward on the coast on January 11. During the period that these signals were displayed one of the most severe storms of which we have a record prevailed along the entire coast, verifying the storm signals at all points. Some damage

resulted, but undoubtedly the injury was greatly diminished owing to the display of the signals, for hardly a vessel attempted to leave any California port during the time the signals were displayed. In many instances regular liners remained in port; vessels that were out were in some instances a number of days overdue owing to the storm; the schooner *Jewel* was wrecked off the Mendocino coast; the river steamers between this point and Sacramento were forced to seek places of safety; the freight ferryboat *Thoroughfare* nearly capsized owing to the cars being thrown from the track; a large amount of injury was done to streets, sewers, etc. At the towns on the north side of the bay considerable injury resulted; several small houses were blown down and others were unroofed. Considerable damage was done to the sea wall at Sausalito; piling was washed out, railroad tracks flooded, etc.—*W. H. Hammon, Professor.*

PORTLAND, OREG., FORECAST DISTRICT.

Vessels remained in port during wind signals. During the gale of the 13-14th, on Puget Sound, the ship *Adelana*, at anchor at Tacoma, sunk. The disaster was due to the manner in which the ship was moored. She was held by a cable and ballast logs and the latter moved. She had discharged her freight and ballast and a slight change in position was sufficient to cause her to dip, fill with water, and sink.

The snow forecasts issued were of great benefit to railroad companies, farmers, and stock men.

The river warnings issued on the 21st were of special value to merchants on Front street. Many were preparing to move goods from cellars, but desisted when assured that there was no danger from flood.—*B. S. Pague, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

During the month there were ten highs and fourteen lows sufficiently well defined to be traced on Charts I and II. The accompanying table exhibits some of the principal points relating to the place of origin and disappearance, the duration and velocity of these conditions, and the following more particular description is added:

Highs.—Six of the highs were first noted to the north of Montana, and the other four in the middle Rocky Mountain plateau. The general path was toward the east and northeast. One was last seen in the west Gulf, five off the south Atlantic coast, and three near Newfoundland. No severe cold waves were experienced during the month. On the evening of 4th, as high No. II was central in the north Rocky Mountain region, a fall in temperature of 35° in twenty-four hours occurred at La Crosse, and of 32° at Dubuque and Keokuk. The next morning Keokuk and Davenport experienced a fall of 40°. On the morning of 7th, as high No. III approached the middle Gulf States, there was a fall of 40° at Atlanta, and of 38° at Montgomery. On morning of 26th, as high No. VIII moved to the north of Dakota, a fall in temperature of 54° occurred at Qu'Appelle, and of 50° at Williston. On the morning of 27th, as the same high moved to northeast Kansas, there was a fall of 46° at Parry Sound, and of 44° at Alpena.

Lows.—Of the storms of the month two were first noted off the north Pacific coast and two off the south Pacific. Four were first seen to the north of Montana and three near Manitoba, and the three remaining were first seen in Texas. The path of all the storms was east and northeast, and twelve of them disappeared over or near Newfoundland. No. IV was last seen in the middle Gulf, and XII disappeared off the middle Atlantic coast.